Bionic plants developed at MIT focus on the “tech” half of biotech

Plants are a preferred platform for our biotechnological future. From the “bio” side of biotech (i.e. genetic engineering), we’ve already gifted them with herbicide resistance, the ability to produce their own pesticides, and the capacity to produce specific chemical compounds for us in addition to the food, fuel, and oxygen they already provide. Heck, we’ve made them glow.

But let’s not forget the “tech” side: researchers at MIT have used nanomaterials to augment plants existing biological abilities — and add some entirely new ones. According to MIT News:

> In a new *Nature Materials* paper, the researchers report boosting plants’ ability to capture light energy by 30 percent by embedding carbon nanotubes in the chloroplast, the plant organelle where photosynthesis takes place. Using another type of carbon nanotube, they also modified plants to detect the gas nitric oxide.
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> Together, these represent the first steps in launching a scientific field the researchers have dubbed “plant nanobionics.”

The “how” of enhancing photosynthesis here is especially interesting. The carbon nanotubes embedded in chloroplasts apparently acted as tiny, tiny antennas. Plants normally absorb only a limited portion of light to convert into energy. Light itself is part of the same electromagnetic spectrum as the radio waves your car’s antenna picks up or the microwaves you might use to cook food. The nanotubes let the chloroplasts absorb a wider spectrum of light, giving them more “material” for the process of photosynthesis.

The researchers also showed that they could successfully embed carbon nanotube sensors into plants as well — and they already have a wide range of such sensors that have been developed previously for everything from hydrogen peroxide to TNT. The idea here is that bionic plants could become environmental sentinels:

> By adapting the sensors to different targets, the researchers hope to develop plants that could be used to monitor environmental pollution, pesticides, fungal infections, or exposure to bacterial toxins.

Of course, there’s no reason that this burgeoning field of plant nanobionics couldn’t work in tandem with genetic engineering to produce even more impressive results.

Read the full, original story: Bionic plants: Nanotechnology could turn shrubbery into supercharged energy producers or sensors for explosives.

Additional Resources:

- Emerging tools for synthetic biology in plants, Plant Journal

- Rose scented trees? Genetic modification could create safe chemical factories, Seattle Times
- Fast growing, pest resistant GE poplar tree could revolutonize paper industry, Phys.org